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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,508	01/23/2004	Christian Velez	FRG-15267	7237
40854	7590	08/22/2005	EXAMINER	
RANKIN, HILL, PORTER & CLARK LLP 4080 ERIE STREET WILLOUGHBY, OH 44094-7836			LOUIE, WAI SING	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

4A

Office Action Summary	Application No. 10/763,508	Applicant(s) VELEZ ET AL.	
	Examiner Wai-Sing Louie	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 19 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- The disclosed specification does not disclose “the second contact forming a permanent electrical contact between a P-layer and an N-layer of the pn junction in the absorber region”.
- The disclosed specification does not disclose, “the second contact includes a wire contact between a layer having the electrical potential of the p-layer and a layer having the electrical potential of the n-layer”.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2814

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-15, 17, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fouquet (US 5,252,839).

With regard to claims 1-2 and 9, Fouquet discloses a superluminescent light-emitting diode (col. 4, line 39 to col. 9, line 68 and fig. 2) comprising:

- A pn junction 56 and 58 (col. 6, lines 10-18 and fig. 2);
- A waveguide 40 and 42 defining an optical beam path (col. 5, line 66 to col. 6, line 3 and fig. 2);
- A heterostructure including a gain region 50 and an absorber region 52 in series with the gain region 50 in the optical beam path (col. 6, lines 7-10);
- The waveguide comprises two end facets, the end facets being perpendicular to the optical beam path (col. 6, lines 25-30 and fig. 2);
- A first contact for applying a voltage to the pn junction in its forward direction in the gain region (fig. 5), so as to produce light emission from the gain region 50 and along the optical beam path (col. 6, lines 25-28);
- A second contact contacting the pn junction in the absorber region 52 (fig. 5) and operable to remove charge carriers generated by absorption in the absorber region 52 at zero bias (col. 6, lines 12-18 and col. 8, line 28).

Fouquet discloses the second contact is split from the n-contact (col. 6, lines 36-40), but not being connected to an active voltage source. However, when the structure recited in the reference is substantially identical to that of the claims,

claimed properties or functions are presumed to be obvious. Where the claimed and the prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977).

With regard to claim 3, Fouquet discloses the pn junction comprises an n-doped side 42 and where at least of the n-doped side 42 and the p-doped side 40 is connected, by the second contact, to a metallic surface 56 outside the heterostructure (fig. 2b).

With regard to claims 5 and 8, Fouquet discloses the semiconductor heterostructure in the gain region 50 comprises:

- A multiple quantum well (MQW) structure 32 (col. 5, lines 55-62) where the pn junction is formed in the MQW structure (fig. 2);
- A first n-doped cladding layer 42 being in electrical contact to a first metal electrode 54 and a second p-doped cladding layer 40 being in electrical contact to a second metal electrode 58 (fig. 2);
- The first and second electrodes 54 and 58 being interrupted between the gain region 50 and absorber region 52 (fig. 2).

With regard to claims 6-7, Fouquet discloses waveguide layers 40 and 42 (col. 5, lines 67-68) and the waveguide is index guided and gain guided (col. 3, lines 44-50).

With regard to claims 10 and 13, Fouquet discloses the semiconductor heterostructure forming a waveguide structure (layers 40, 32, and 42) defining an optical beam path (col. 5, line 67 to col. 6, line 3 and fig. 2) and including a gain region, the gain region emitting, upon

injection of a current through contact means 54 to 58, electromagnetic radiation into the optical beam path, the waveguide structure further including an forward bias (unbiased) pn junction in series with the gain region in the optical beam path (col. 6, lines 7-16 and fig. 2).

With regard to claims 11 and 15, Fouquet discloses the waveguide structure comprises two end facets 60 and 64 limiting the waveguide structure in a longitudinal direction parallel to the optical beam path, the end facets 60 and 64 being perpendicular to the longitudinal direction (col. 6, lines 24-48 and fig. 2).

With regard to claim 12, Fouquet discloses the SLED comprising monitoring means for monitoring a photocurrent (75 mA) generated by radiation emitted in the active region and absorbed in the unbiased pn junction, producing a monitoring signal (75 to 85 dB) being measure of the light emitted in the gain region 50 (col. 8, lines 14-35).

With regard to claim 14, Fouquet discloses the charge carrier reservoir comprises a metallic surface (fig. 2b).

With regard to claim 17, in addition to the limitations disclosed in claim 1 above, Fouquet also discloses:

- Two end facets 60 and 64 limiting the waveguide structure in a longitudinal direction parallel to the optical beam path, the end facets 60 and 64 being perpendicular to the longitudinal direction (col. 6, lines 24-48 and fig. 2).

With regard to claim 19, in addition to the limitations disclosed in claim 1 above, Fouquet also discloses:

- The second contact contacting the pn junction in the absorber region, the second contact forming a permanent electrical contact between a p-layer 56 and an n-layer 44 of the pn junction in the absorber region (fig. 2a and 2b).

With regard to claim 20, Fouquet discloses a wire contact between a layer 56 having the electrical potential of the p-layer and a layer 44 having the electrical potential of the n-layer (col. 6, lines 12-18).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fouquet (US 5,252,839) in view of Swirhun et al. (US 5,577,064).

With regard to claim 4, Fouquet discloses the pn junction in the gain region 50 and in the absorber region 52 is made of bulk semiconductor material (col. 9, line 10) comprising a p-doped component 40 and n-doped component 42, but do not disclose having a layer thickness exceeding 10 nm. However, Swirhun et al. disclose the thickness of the layers reflecting the light emitted from the action region are sized by a general formula $\lambda/4n$, where λ is the wavelength of the light emitted (Swirhun col. 2, lines 29-35). Swirhun et al. teach the SLED design is similar to the VCSEL except the absence of the mirrors and the layer is sized for reduced reflectance (Swirhun col. 2, lines 1-7). Fouquet and Swirhun et al. have substantially the same environment of the SLED. Therefore, it would have been obvious for the one with ordinary skill in the art to modify Fouquet's device with the teaching of Swirhun et al. to size the layer with the formula $\lambda/4n$ in order to reduce reflectance for the device.

Fouquet discloses the wavelength emitted is 1.3 and 1.55 microns and, thus, the thickness of the layer sized by the formula $\lambda/4n$ would exceed 10 nm.

Response to Arguments

Applicant's arguments filed 5/31/05 have been fully considered but they are not persuasive.

- Applicant argues that the second contact of Fouquet's device is connected to an active voltage source. Please see the new rejection above.
- Applicant argues Fouquet fails to disclose an unbiased pn junction of the superluminescent light-emitting diode. However, Fouquet discloses the device could be operated under no-bias condition (see fig. 1a).
- Applicant argues Fouquet does not disclose a charge reservoir in the device. However, the charge reservoir is the bottom electrode (see page 7 of the specification) and Fouquet discloses a bottom electrode in the device. Therefore, statements of intended use, or functional language do not structurally distinguish claims over prior art, which can function in the same manner, be labeled in the same manner, or be used in the same manner. See in *re Pearson*, *Ex parte Minks*, and In *re Swinehart*.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

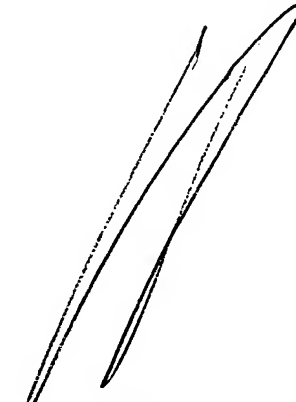
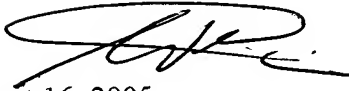
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wsl
August 16, 2005.



LONG PHAM
PRIMARY EXAMINER